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The Production and Use of Fuel Briquettes in the Soviet Bloc

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The Production and Use of Fuel Briquettes in the Soviet Bloc

Summary

Since 1946 the manufacture of bituminous and brown coal briquettes has assumed new and great importance in East Germany and, to a lesser degree, in the Soviet Union. Prior to World War II, fuel briquettes had always been considered primarily a domestic fuel and secondarily a railroad and river boat fuel. However the growth of the rift between East and West in Europe has forced the Satellite countries to attempt to attain self-sufficiency in fuel. The Soviet Union is pressing for the development of a briquette industry because their planned economic expansion demands a constantly increasing fuel supply of every available type.

The largest producing country among the Satellites is East Germany which attained production of 43,682,000 metric tons in 1951, a quantity four times the planned annual capacity of the USSR for 1950. The other members of the Soviet Bloc produce only fractions of a million tons a year which are of little industrial or economic significance.

The consumption pattern of fuel briquettes in East Germany has changed considerably in the past 15 years. In other countries it has remained much the same. Before World War II, domestic consumers in East Germany received 60 percent of the fuel briquette supply, but in 1949 this had been reduced to 8 percent. The pre-war pattern has shifted and railways, synthetic fuel plants, thermal power plants, and exports require almost equal quantities of the remaining 92 percent of the total.

Great attention is being given to the future of the briquette industry in East

Germany and the Soviet Union. The most recent experiments have been toward improving the quality of the product and using them in one step in the manufacture of metallurgical grade coke. This process has not yet been applied on a large scale but trials are reported to have been successful.

Production of briquettes in the Soviet Bloc for the next hundred years will not be limited by the failure of supply of raw coal. However, its continuation depends on the ability of the technicians of the industry to design and bring into production the equipment required for their manufacture. Access to the source of equipment in West Germany has been denied to the Bloc. There is evidence that the Soviet Zone of Germany is having some success in this field and the reconstruction and expansion of 17 briquette plants is planned for 1952. Little is known of this facet of briquette production in any other country of the Soviet Bloc.

I. Introduction

A. General

The manufacture of fuel briquettes is a process by which various qualities and and sizes of coal are formed into uniformly sized shapes. Promarily the precess provides a method of utilizing other wise waste coals, such as the dust and fines obtained in cleaning and grading coals. Of even greater importance in some areas, are the beneficial effects which the process has upon the low grade coals, mainly lignite and brown coal. The important deficiencies of low grade coals are: low heating value due to high moisture content; a strong tendency to spontaneous combustion and disintegration under storage; and extreme friability or slacking under transportation conditions. The briquetting of these coals, with the attendant reduction of moisture content, lessens the slacking tendency and increases the heat value. It also reduces the surface area exposed per given weight and therefore the danger of spontaneous combustion is minimized.

Briquettes are made in essentially two different weights: the brick shaped type which may weigh up to seven kilos, and the small ovoid, round, or pillow-shaped types, usually about three inches long, with a minimum weight of 50 grams.

B. History and Technology

The manufacture of fuel briquettes started in Germany with the opening of the first briquette plant in 1861. Originally the process was applied solely to bituminous coal dust which was mixed with coal-tar pitch and then pressed into briquette moulds. The finished briquettes were of two sizes, one weighing about 50 grams and the other about 500 grams.

In modern practice there are four steps involved in the manufacture of bituminous coal briquettes and they are usually accomplished by the same unit driven by the same motor. First the coal fines and the coal-tar pitch, in cold crushed form, are (1) mixed intimately and kneaded for not less than six minutes at a temperature between 20 to 25 degrees centigrade. The mixture, now the consistency of paste, is then (2) cooled in a conditioner at a temperature of 5 to 6 degrees centigrade and (3) distributed to the presses for (4) moulding. The two German types of presses are the roll and the hydraulic. The latter has an hourly capacity of 4-20 metric tons of briquettes. The former may be one of two types, either the single- or double-mould roll type with capacities of 10 to 40 and 20 to 80 metric tons per hour, respectively. The duration of compression is about 0.1 second in a double roll press and 0.4 second in a hydraulic press.

The briquetting of brown coal, also introduced in Germany, occurred at a somewhat later date than that of bituminous coal dust. The first press was of a ram type, known as the "Exter" after its inventor. Some twenty years ago the Krupp and Lurgi firm developed a new type known as the ring-roll. The procedure in the manufacture of brown coal briquettes differs in two ways from that of bituminous briquettes. First, no binder is needed, and second, brown coal must be ground to a uniformly fine size before entering the presses.

German methods and machinery have been commonly adopted in all European countries. Western Germany was the source of all the briquette plants now in operation, with the exception of whatever the Satellites and the USSR may have been able to produce since World War II. In some of the older types of brown coal briquette presses a considerable amount of friction would develop which required the frequent repair and replace-

ment of moulds. It is possible that a good many of the presses in the Satellites and the USSR may have this deficiency.

Prior to World War II briquettes were consumed almost exclusively in domestic heating apparatus and railroad and river transport boilers. At least this was the case in Germany and presumably was so among the followers of her methods. Since the development of the shortage of bituminous coal in Europe, briquettes have been substituted wherever possible. Where conversion of furnaces has been incomplete, the size of the briquettes must be no smaller than the customary grade of coal formerly used. Generally speaking, the only specifications as to the size or weight of the briquette are the measurements and firing capacity of the furnaces.

II. East Germany

A. Introduction

In the past eight years the manufacture of brown coal briquettes has been developed to a greater extent in Eastern Germany than in any other country. In 1951 about 72 percent of the total brown coal production was made into briquettes.[1/a/] Since the end of World War II this industry has become vital to the economic life of the area. Currently, it is most important due to the loss of hard coal supplies from Western Germany since 1948 and from Upper and Lower Silesia (now parts of Poland) since 1945. The magnitude of these losses is indicated by the fact that no significant tonnages are received now from West Germany. Supplies from the Silesian fields were only 170,000 metric tons in 1948 compared to nine million metric tons in 1937.[2/] These losses have compelled many of the coal consuming industries and domestic consumers to use the available brown coal either in raw, pulverized, or briquetted form[3/]. To satisfy the demands of industry, domestic users have suffered and their consumption has dwindled from a prewar 66 percent[4/] of total briquette production to 8 percent in 1949. Coke plants and a few other industries have priority demand on all supplies of hard coal.

The brown coal briquette industry in the Soviet Zone is divided into two administrative parts. One, fully controlled by the Soviet occupyong forces, is known as the Soviet Aktiengesellschaft (Soviet Joint Stock Company – SAG). This consists of nine combines[5/] controlling seventeen briquette plants which produced 40.5 percent of the total Soviet Zone production in 1949.[6/] The names of these combines, or SAGs, are: Borna, Deutzen, Bohlen, Espenhain, Deuben-Pirkau, Profen, Pfannerhall, Nachterstedt, and Friedlander.[7/] The remaining 59.5 percent of production came from

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a/ Us[illegible] raw brown coal for each ton of briquettes (195[illegible] Plan)

briquette plants controlled by the German Democratic Republic. These are administered in groups known as the Vereiningungen Volkseigener Betriebe (Association of Nationally Owned Enterprises - free translation) generally identified as VVBs. Administration centers for these enterprises are: Borna, Meuselwitz, Mereeburg, Bitterfeld, Magdeburg, Lauchhammer, Senftenberg, and Welzow.

All SAG and VVB enterprises are located in the three important brown coal producing districts of Eastern Germany: Lausitz, Braunschweig-Magdeburg, and Halle-Leipzig. The Borna fields in the Halle-Leipzig district contain the largest mines[8/] and the largest SAG enterprises are located in this area at Borna, Deutzen, Bohlen, and Espenhain. The westernmost center of the brown coal briquette industry in Eastern Germany is the SAG Osterniernburg in the Braunschweig-Magdeburg district; the easternmost center is the Hirschfeld VVB briquette factory in the Welzow administration center on the Polish border which obtains its brown coal supplies from Poland.

B. Production

The production of brown coal briquettes has increased steadily since 1946 and reached 43,682,000 metric tons in 1951. This total was not far below the wartime high of 44,619,000 metric tons in 1943.[9/] Following the war, output of 26,837,000 metric tons in 1947[10/] was only 60 percent of that in 1943. This low rate of production after the war was brought about by the general post-war chaos lasting through 1946-47, and from the dismantling program carried out on both mines and plants by the Soviets.[11/] The most serious effects of the dismantling program were felt in coal production which in turn limited the quantity of brown coal available for briquettes.

The briquette plants themselves have been more severely affected by the cessation of trade with Western Germany since the establishment of the blockade in 1948. Since that date the replacement of worn-out equipment, chiefly moulds [12] and presses [13], has been curtailed and has retarded briquette production. For example in 1949, only 71 percent of the 1938 stocks of briquette presses was available [14].

The Planning Commission of the Soviet Zone envisaged an increased total production of 38,195,000 metric tons in 1952 [15] and reaching 60,900,000 metric tons in 1955 [16]. As may be noted (in Table I) the goal for 1952 was exceeded by the actual production in 1951 and will probably be exceeded in 1952. However, to reach the 1955 figure, measures for increased mechanization were introduced on 10 August 1950, although there appears to be only a slight possibility of achieving the mechanization ordered. In the past additional labor has always solved the problem of increased production, but since new machines to replace old ones are now required, it remains to be seen how far the growing labor force can compensate for the lack of mechanization. [17] In addition, the drive to increase production has had the unfortunate result of increasing the moisture content of the briquettes, probably due to less thorough drying of the raw coal in order to meet output goals. Cognizant of this condition, the State Planning Commission has decided upon a reconstruction, expansion, and conversion program. [18] The conversion phase of this program will involve a change from the production of normal briquettes to the production of fine-grain briquettes at the following VVB briquette plants: [19]

District	Plant
Merseburg	Brikettfabrik Grosskayna
	Brikettfabrik Beuna, Werk Grosskayna
	Brikettfabrik Krumpa, Werk Muecheln
Borna	Brikettfabrik Kulkwitz
Magdeburg	Brikettfabrik Volpke
Lauchhammer	Brikettfabrik Plessa
Senftenberg	Brikettfabrik Impuls
	Brikettfabrik Meurostolln
	Brikettfabrik Mehring
	Brikettfabrik Klara Zetkin
	Brikettfabrik Aufstieg
Welzow	Brikettfabrik Heide
	Brikettfabrik Jonny- Scheer
	Brikettfabrik Spreetal
	Brikettfabrik Kausche, Alfred Scholzwerk
Meuselwitz	Brikettfabrik Kriebitzsch
	Brikettfabrik Zechau, Tagebau und -,

Fine grain briquettes produced in these factories will have a water content of only 10 percent as compared to a water content of not less than 12 percent,[20] but usually ranging from 14.4 to 18 percent,[21] in briquettes produced by old and unconverted plants. It is believed that the conversion and reconstruction will involve the introduction of more efficient drying apparatus and grinding or pulverizing machines. The briquettes produced should then be more efficient having less moisture per ton, and being less friable, having been made of uniform particles. Substitution of the new briquettes in locomotives alone will result in a 15.5 percent saving in fuel, or 265,000 metric tons in 1952, and 530,000 metric tons in 1953.[22]

Table I shows actual brown coal briquette production from 1946 through 1950 and estimates for the years 1951, 1952, and 1953 (Fiscal) based on official Five Year Plan figures.

Table I East Germany

Brown Coal Briquette Production, 1946 - Fiscal 1953
(thousands metric tons)

Year	Brown Coal Briquettes
1946	28,912 23/
1947	26,830 24/
1948	30,345 25/
1949	34,698 26/
1950	38,490 27/ a/
1951	43,682 28/
1952	47,270 29/
1953 (Fiscal)	47,500 30/

a/ This figure is based on the sum of actual production figures of VVB's and SAG's for the total annual production. "Perspectivplan" figure was 36.5 million metric tons and estimate based on half year production figures gives 38.2 million metric tons.

Table II shows 1950 production by VVB administration district and plant. The SAG Combines have been included under the VVB districts to facilitate comparison of figures and to illustrate more clearly the areas of heavy industrial and mining concentration.

Table II East Germany

VVB and SAG Brown Coal Briquette Production

Thousands of Metric Tons

District	Combine or Plant	Location	Production 1950 31/ 32/	Production Jan.-June 33/ 1951
BORNA				
VVB's	Haselbach	Haselbach		118.3
	Trahna	Trahna		263.1
	Rahmsdorf	Rahmsdorf		71.9
	Witznitz	Witznitz		196.6
	Gross Zossen	"	2,611.7	228.6
	Lobstadt	"		173.1
	Neukirchen	Neukirchen		183.1
	Leipnitz	Leipnitz		9.4
	Flora	Rogaitz		3.9
	Kulkwitz	Kulkwitz		148.2
VVB Total			2,611.7	1,396.2
SAG's	Espenhain	Espenhain	5,178.9	
	Bohlen	Bohlen	3,336.1	
	Borna	Borna	1,093.1	N.A.
	Deutzen	Deutzen	1,012.9	
SAG Total			10,621.0	
District Total			13,232.7	
MEUSELWITZ				
VVB's	Zechau	Zechau		204.2
	Kriebitsch	Kriebitsch		100.7
	Rositz	Rositz		247.1
	Phoenix	N.A.		432.3
	Theissen	N.A.		163.0
	Zeitz	Zeitz	3,480.0	31.3
	Ellen	Draschwitz		52.6
	Groitschen	Groitschen		117.0
	Zipsendorf I	Zipsendorf		105.8
	II	"		42.8
	III	"		197.1
	IV	"		118.9
VVB Total			3,480.0	1,812.8
SAG's			-0-	
District Total			3,480.0	
MERSEBURG				
VVB's	Walter's Hoffnung	Stedten		199.5
	Unteroblingen	Unteroblingen		98.1
	Kupferhammer	N.A.		47.7
	Bruckdorf	Bruckdorf		149.9
	Vonder Heydt	Ammendorf		53.3
	Hermine Henriette	Osendorf	4,944.8	37.3
	Muechln	Muechln		448.4
	Neumark Ost	N.A.		325.2
	Krumpa	N.A.		251.2
	Gross Kayna	N.A.		683.8
	Gute Hoffnung	Weissenfels		192.2
	Beuna			237.1
VVB Total			4,944.8	2,723.7

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Table II (con't.)

VVB and SAG Brown Coal Briquette Production

Thousands of Metric Tons

District	Combine or Plant	Location	Production 1950 31/ 32/	Production Jan.-June 33/ 1951
SAG's	Deuben Combine	Deuben	899.6	
	Marie	"	408.8	
	V. Voss	"	473.5	
	Wahlitz	Profen	244.3	N.A.
	Profen	"	261.3	
	Hedwig	"	375.4	
	Pfannerhall	Pfannerhall	916.6	
- SAG Total			3,579.5	
District Total			8,524.3	
BITTERFELD				
VVB's	Edderitz	Edderitz		61.8
	Holzweissig	Holzweissig	1,301.4	391.7
	Freiheit I, II, IV	N.A.		192.4
	Hermann Fahlke	Sandersdorf		31.6
VVB Total			1,301.4	677.5
SAG's	-0-		-0-	
District Total			1,301.4	
MAGDEBURG				
VVB's	Unseburg	Unseburg		111.9
	Osterweddingen	Osterweddingen	205.4	
	Velpke	Nachterstedt		N.A.
VVB Total			205.4	111.9
SAG's	Nachterstedt	Nachterstedt	1,001.6	N.A.
SAG Total			1,001.6	
District Total			1,207.0	
LAUCHHAMMER				
VVB's	Klein Leipisch	Domsdorf		
	Hansa	"		
	Wildgrube	"		
	Louise	"	2,499.8	
	Plessa	Plessa		150.6
	Lauchhammer Ost	Lauchhammer		526.3
	" West	"		240.8
VVB Total			2,499.8	1,316.2
SAG's	-0-		-0-	
District Total			2,499.8	
SENFTENBERG				
VVB's	Impuls	N.A.		131.3
	Franz Mehring	N.A.		615.1
	Meuroatalln	N.A.		210.1
	Ferdinand La Salle	N.A.		299.8
	Tatkroft	Sedlitz	4,344.8	167.9
	Morgenrot	N.A.		143.4
	Josef Briswig	N.A.		234.9
	Rosa Luxemburg	N.A.		132.6
	Klara Zetkin	N.A.		179.2
	Aufsteig	N.A.		172.9
	Matador	Reppist		86.9
VVB Total			4,344.8	2,374.0
SAG's	-0-		-0-	
District Total			4,344.8	

Table II (con't.)

VVB and SAG Brown Coal Briquette Production

Thousands of Metric Tons

District	Combine or Plant	Location	Production 1950 31 / 32/	Production Jan.-June 33/ 1951
WELZOW				
VVB's	Kausche	N.A.		86.7
	Konrad	Forst		37.4
	Spreetal	N.A.		78.5
	Johnny Scheer	Laubusch		249.8
	Gluckauf	Knappenrode	2537.9	
	Heide	N.A.		171.1
	Zeisholz	N.A.		187.2
	Hirschfelde	Hirschfelde		229.8
	Heidemuhle	N.A.		123.1
	Welzow	Welzow		130.5
VVB Total			2537.9	1602.3
SAG's	-0-		-0-	
District Total			2537.9	
Total VVB Production			21925.8	
Total SAG Production			15202.1	
Grand Total			37127.9 a/	

a/ The discrepancy of 1.3 million metric tons between this total and the annual figure given in Table I for 1950 is probably to be accounted for by the production of small, independently-owned briquette plants.

C. Export

The following table (Table III) shows the quantity and destination of brown coal briquette exports for the years 1946 through 1951. Figures for 1946 through 1950 are data supplied by importing countries in the majority of cases. Exported quantities to the USSR are almost wholly estimated and are based on the knowledge that 65,000 metric tons in July and 61,000 metric tons in August 1948 were shipped through Rostok and that in addition a considerable quantity were shipped by rail.

The planned total export figure for 1951 was 2.4 million metric tons. Totals for other years are not given because the data by countries of destination are fragmentary.

Indications of which briquette plants supply the export quotas for which country are not conclusive or complete. The following chart contains the extent of information available on this subject:

Destination	Origin	Quantity	Year
USSR - Nevskie Chemie Leningrad 62/	"ROZ" a/ "Sonne" "Union"	Unknown	Unknown
Czechoslovakia 63/	Kombinat Bohlen	333,000 MT/ month	1951
Denmark 64/	Kombinat Bohlen	Unknown	1950
Italy 65/	Kombinat Bohlen	Unknown	1951
Sweden 66/	Kombinat Bohlen	Unknown	1951
Switzerland 67/	Kombinat Profen b/ Kombinat Bohlen	Unknown	1950
West Berlin 68/	Kombinat Profen c/ Kombinat Bohlen	Unknown	1951

a/ Names in quotation marks are actual bag markings noted on the grounds of the Nevskie Chemie, Leningrad. It is believed that "ROZ" stands for Russian Occupied Zone, a commonly used label. It is known that "Sonne" and "Union" are names of briquette Plants.

b/ In 1949, 50 percent of the production of this Combine, or approximately 402,250 metric tons, was exported to Sweden and Switzerland.

c/ Ibid

TABLE III-East Germany
Exports of Brown Coal Briquettes by Countries of Destination, 1946- 1951

(metric tons)

Destination	1946	1947	1948	1949	1950	Plan 1951 [34]	1951 Jan. to Oct. [35]
Austria					47,100 [36]	87,619	296,400
Belgium						20,000	2,200
Czechoslovakia		1456 [37]		100 [38] c/		300,000	N.A.
Denmark	16,105 [39]	247,630 [40]	-0-	198,500 [41]	258,600 [42]	70,000	30,800
Finland					-0-	30,000	4,700
France					-0-	100,000	8,000
Italy					-0-	120,000	N.A.
Netherlands					-0-	300,000	N.A.
Norway	422 [43]			9,700 [44]	-0-	27,027	22,300
Poland				49,602 [45] d/	106,000 [46] e/	363,000	N.A.
Sweden	25,579 [47]	688,047 [48] f/	174,857 [49] g/		5,200 [50] k/	460,000	427,000
Switzerland		88,712 [51] i/	68,914 [52] i/	3,608 [53] i/	-0-	26,029	N.A.
U.S.S.R.		800,000 [54] k/	1,200,000 l/	1,508,000 [55] m/	2,120,000 [56] n/	16,000	N.A.
West Germany			123,198 [57]	5,800 [58]	435,800 [59]		245,400
Berlin, W. Zone	100,000 o/	200,000 o/	210,867 [60]	200,000 o/		500,000 [61] p/	N.A.

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TABLE III - East Germany

Footnotes

a/ These are the official export figures published by the GDR government.

b/ First six months only.

c/ An official GDR figure.

d/ Ibid

e/ Source 49/ gives the following figure to Poland: 140,000 metric tons.

f/ This figure was listed in the International Coal Trade as a Swedish import from "Germany". Since statistics for Western Germany show no shipments of brown coal briquettes, it is assumed that said amount came entirely from the Soviet Zone.

g/ Ibid

h/ Source 53/ gives Swedish imports as 5,050 metric tons.

i/ These are derived figures which may be inaccurate. International Coal Trade (ICT) July 1949, reported that Switzerland imported from Germany 141,733 metric tons in 1947, and 160,950 metric tons in 1950. ICT, June 1949 reported that Western Germany exported to Switzerland 53,089 metric tons in 1947 and 92,054 metric tons in 1948. Figures in the table are indicated exports to Switzerland and include 68 metric tons of lignite in 1947 and 18 metric tons in 1948.

j/ A Polish figure which includes 420 metric tons of raw lignite.

k/ Estimated; reference document reports shipments from Rostok by boat to the USSR as 65,000 metric tons in July and 61,000 metric tons in August. In addition there were probably considerable rail shipments.

l/ Estimated.

m/ A Polish figure.

n/ Source 57/ gives 2,350,000 metric tons.

o/ Estimated.

p/ Source 61/ confirms the Plan figure.

It is also known that daily shipments leave the Bitterfeld VVB Briquette plant for the port of Rostok. It is highly probable that these too are destined for export to Sweden, Denmark, and the USSR.[69]

D. Consumption

The consumption pattern of brown coal briquettes in the Eastern Zone had undergone a radical change during the post-war years. Before World War II, 60 percent of total production was consumed in household use.[70] whereas in only 8 percent was used by domestic consumers in 1949. The general distribution pattern in 1949 was as follows: 23 percent - railways; 22 percent - production of synthetic fuel; 20 percent - thermal power stations; and 8 percent - domestic use; the remaining 17 percent was used for export and the occupation powers.[71] Since the date of this information there is evidence that domestic consumption has been cut even more since the production of synthetic fuel has been increased.[72] For example, it is known that the Bohlen Combine has upped its production of synthetic fuel by 73 percent since the outbreak of the Korean War and thus absorbs almost all of its briquette production except that consigned for export.[73] Ways of improving briquettes are constantly being sought so that they may be substituted in industry for the hard coal and hard coal coke which are so scarce.[74] The Impuls and Tatkraft briquette plants have been indicated as the manufacturers of a "special" type of briquette for the exclusive use of the steel plants at Hennigsdorf and Riesa.[75]

Recently experiments have been undertaken to prove the feasibility of using brown coal briquettes as a raw material for the manufacture of metallurgical coke. The apparently successful experimental work at VEB Gaswerk Delitzsch, Bitterfeld,

resulted in plants to remodel the two briquette plants at Lauchhammer according to the proven specifications. These two plants will have a capacity of 4,700 metric tons of brown coal briquettes per day. Of this, 4,200 metric tons will be used to produce 2,000 metric tons of metallurgical coke per day. The coke thus obtained will be used for low shaft blast furnaces and chemical industries. Planned date of completion is 1 January 1953.[76]

Although available information does not permit the definition of a clear plant-to-consumer pattern with the names and locations of both established, the following list shows the principal power stations of the Soviet Zone which consumed brown coal briquettes in 1949.[77]

Industrial Power Plants

SAGs	VVB(Z)
"Kali" Heiligenroda	Zeiss-Jena (Westglas)
" Kaiserroda-Merkers	Schwarz-Zellolle (Kunstfaser)
" Sachsen-Weimar	Sondershausen (Kali & Salze)
" Bismarckhall (Bischoffsrode)	
" Bleicherode	
" Volkenroda	
" Sollstedt	
"Zement" Tile Factory, Boizenburg	
"Sinthese" Golzau	
" Troglitz	
"Kautschuk" Bad Blankenburg	

District Power Plants

VVB(Z) Energiebezirk Nord	VVB(Z) Energiebezirk Sud
Finow	Breitungen
Potsdam	Gispersleben
Peenemunde	Erfurt
Stralsund	Gotha
Brandenburg	Apolda
Wolgast	Eisenach
Rostok-Bramow	Gera
Prenzlau	Auma
Cottbus	Weimar
Wittenberg	

District Power Plants (cont.)

VVB(Z) Energiebezirk Ost	VVB(Z) Energiebezirk West
Oschatz	Bleicherode
Dresden-Albertstadt	
Dresden Drewag	
Greiz	
Meissen	
Freiberg	
Oberlungwitz	
Cossebaude	
Gross-Rohrsdorf	
Glauchau	
Klingenthal	
Reichenbach	
Chemnitz	
Schwarzenberg	
Schweinsberg 78/	

Smaller power stations, believed to be part of privately owned manufacturing installations and located in Thuringia, are as follows: 79/

Weimar Railroad Car Plant
RMW Eisenach (Automobile factory)
Maximilianshutte Unterwellenborn
Bottcher Factory, Porstendorf
Blankenstein Paper Factory
Eisenach Worsted Yarn Factory
Hirschberg Leather Factory
Mulhausen Dye Works
Zeulenroda Furniture Plant
Mauxian Saalfeld.

It is of interest to note that some briquette plants supply only the domestic market, such as Zeitz, Herman Fahlke, Volpke, Plessa, and Louise (Domsdorf), 80/ although the specific category of consumer has not been indicated.

B. Capabilities, Vulnerabilities, and Intentions

Further development of the briquette industry and expolitation of its products should be possible for the next century in Eastern Germany, where reserves of brown coal are estimated at 25 billion metric tons. Currently, production is somewhat hindered by lack of new machinery and of repair parts for existing equipment. However, planned production goals have been met and exceeded in recent years.

Scarcity of equipment for making briquettes, particularly moulds and presses, has been the principal vulnerability since the cessation of normal east-west trade in 1948. Briquette machinery of all types formerly was supplied from West Germany.

However, recent emphasis on mechanization and modernization plans for a number of state-owned briquette plants indicates that the East Germans have either overcome this deficiency, or have found other sources of equipment.

The necessity for efficient utilization of brown coal is forcing the formulation of aggressive plans for briquette plants. Continued expansion of the industry is indicated by the growing needs of the consuming industries, by still unfilled domestic requirements, and by reportedly successful experimental work in developing new uses.

It is intended to meet general requirements by the increase in production to 60,9million metric tons in 1955, a gain of 39.4 percent over 1951. It is anticipated that the practical application of reportedly successful experimental techniques for production metallurgical coke from brown coal briquettes will help to satisfy the requirements of the iron and steel and the chemical industries.

III. U.S.S.R

A. Bituminous Coal and Brown Coal Briquettes

The production of coal briquettes is not a new industry in the USSR, but it must be regarded as still in the still in the early stages of development. Several hard coal briquette plants were built between 1970 and 1927, and by the beginning of World War II, two more large and important plants had been built. These were the Mospino Plant in the Donbass, which used hard coal, and the Aleksandria in the Ukraine, which used brown coal. After World War II both were reconstructed and expanded as were also several of the older plants in the Donbass.[81]

The Fourth Five Year Plan stipulated the building of 26 new briquette plants with a total annual capacity of 10 million metric tons and an output of 7.4 million metric tons by 1950.[82] However, in 1945, the prerequisits of such a production goal were nonexistant: there was no briquette machinery industry; tar-binder requirements were unavailable; and there were few competent specialists in the entire field.[83] Even by late 1948 official opinion complained of the unsatisfactory progress in the briquette industry and its "unsolved technical problems".[84]

According to the Soviet coal publication Ugol, there are five important areas which could meet the requirements of a briquetting industry, as follows:[85]

Hard Coal	Possible Capacity per Annum (metric tons)
Donbas	8 to 10 million
Urals	0.5 million
Brown Coal	
Middle Asia	1.5 million
Angren	
Shurab	
Sulyukta	
Ukraine	0.5 million
Aleksandria	
Zvenigorodka	
Far East	1.5 to 2.0 million
Raychikha	
Arkhara	

Other possible areas for hard coal briquette manufacture, although of unknown capacity, were Tkvibuli, Suchan Karaganda, Spitsbergen, and Vorkuta. The necessity for building such installations at coal basin railroad centers, ports, large cities, and coke chemical plants also was stressed in the article.

Information collected up to the date of writing indicates that there are 18 hard coal and fourteen brown coal briquette plants in operation, or under construction, in the USSR. They are located as follows: 11 in the Donetz Basin; 8 in the Ukraine; 5 in the Urals; 2 each in Moscow, Central Asia, and the Far East; and one each in Karaganda, and Archangel. The last uses Spitsbergen coal. The following charts(Tables IV-V) shows the distribution of the briquette installations by source and type of raw coal used.

TABLE IV U.S.S.R

Distribution of Known Bituminous Coal Briquette Plants

Source of Coal	Location	Installation	Comment	Capacity (where available)
Donets Basin	Isvarino, Rostov Oblast	Briquette Plant 86/	Under construction as of September 1949.	
	Irmino	Irminskaya Briquette Plant 87/	N.A.	
	Dzerzhinsk	Dzerzhinskaya Briquette Plant 88/	(1935) Under construction	
	Krivorozhskiy	Krivorozhskaya Briquette Plant 89/	Under construction (1935)	
	Nikitovskiy	Nikitovskaya Briquette Plant 90/	Under construction (1935)	
	N.A.	Nikitivskaya Briquette Plant 91/	N.A.	
	N.A.	Novo-Yalovkaya Briquette Plant 92/	N.A.	
	N.A.	Yunkomovskaya Briquette Plant 93/	N.A.	
	N.A.	Novo-Golubovskaya Briquette Plant 94/	To start operating October 1947 (1935)	
	N.A.	Urakhovskaya Briquette Plant 95/	To start operations in the near future (September 1949)	
	N.A.	Mandrykinskaya Briquette Plant 96/	N.A.	Planned production: 300,000 MT

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TABLE IV U.S.S.R.
(cont.)
Distribution of Known Bituminous Coal Briquette Plants

Source of Coal	Location	Installation	Comment	Capacity (where available)
Ukraine	Mospino	Mospinskiy Briquette Plant 97/	Reconstructed	Planned production: 1.2-1.5 Million MT
	Briansk, Voroshilovgrad Oblast	Briansk Coal Mine & Briquette Plant 98/	Construction started 1948; to start operations 1950.	
	Stalino	Briquette Plant 99/	Under construction (1945)	
Urals	Mednogorsk, Chkalov Oblast	Briquette Plant 100/	Expansion intended, no progress made (1946)	
	Kemerovo	Briquette Plant 101/	N.A.	
	Prokopyevsk, Kemerovo Oblast	Briquette Plant 102/	Under construction (1945 - 1947)	
Spitsbergen	Arkhangel	Arkhangelsk Hydrolysis Plant 103/	Operation started. (May 1949)	

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TABLE V U. S. S. R.
Distribution of Known Brown Coal Briquette Plants

Source of Coal	Location	Installation	Comment	Capacity (where available)
Ukraine	Aleksandrja	Aleksandriskiy Briquette Plant 104/	Reconstructed and expanded after WW II	Planned: 1.5 million MT
	N.A.	Baydovskaya Briquette Plant 105/	Under construction (1950)	
	N.A.	Semenovsko-Golovskaya Briquette Plant 106/	Under construction (1950)	
	N.A.	Yurkovskaya Briquette Plant 107/	Under construction (1950)	
	Simferopol, Crimea Oblast	Lignite Briquette Plant 108/	N.A.	
Urals	Bashkiria	Ermolaevskaya Briquette Plant 109/	Under construction (1950)	
	Volchanka, Sverdlovsk Oblast	Briquette Plant 110/	Under construction (1947-1949)	
Moscow	Bronnitsy Station Moscow Oblast	Briquette Plant 112/	To be assembled during 1949-50 (1949)	
	Yepifan	Briquette Plant 113/	Under construction (1947-1948)	

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TABLE V U.S.S.R.
(cont.)
Distribution of Known Brown Coal Briquette Plants

Source of Coal	Location	Installation	Comment	Capacity (where available)
Central Asia	Fergana Oblast	Briquette Plant 113/	N.A.	1950 : 10,000 metric tons Planned : 15,000 metric tons
	Angren, Uzbek SSR	Briquette Plant 114/	Under construction (1950)	
Far East	Raychikhinsk	Briquette Plant 115/	N.A.	
	Artemgres, Primorskiy Kray	Briquette Plant 116/	Under construction	
Karaganda	Novi-Gorod	Briquette Plants 117/	Under construction (1947-1949)	

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B B. Peat Briquettes

Since World War II the manufacture of peat briquettes has been stressed in the USSR in order to increase the potential of peat as an industrial fuel. In its raw state peat has a high moisture content, deteriorates quickly after excavation, and cannot be successfully transported any great distance. However, when briquetted, peat becomes suitable for domestic use, for gas-generator automobiles, and tractors, for thermal power stations, and for industry in general. It is also claimed to be particularly desireable for the production of producer gas for the chemical industry, as it is free from sulphur and phosphorus.[118]

The usual methods of making peat briquettes involve the milling and drying of the raw peat and the formation of briquettes in plunger presses, in much the same manner as brown coal briquettes are made. The variations in this process are found in the drying methods, which may be effected by steam heated driers, heated free air (the PEKO system), or in a current of combustion gases.[119]

Before World War II there were two peat briquette plants in the USSR:[120] Orekhovskiy Plant in the Moscow Oblast with a planned capacity of 180,000 metric tons a year, and average production 60,000 metric tons a year;[121] Tootsi Plant in Estonia with a planned capacity of 50,000 metric tons and an average production of 32,000 metric tons per year.[122] Both of these plants went into operation in 1938.[123]

Increasing post-war emphasis on the peat briquette industry is evidenced in the production goal of 1.2 million metric tons for 1950.[124] To achieve this goal considerable new construction was required and was planned as follows:[125]

Region	Number of Plants	Capacity per Plant (metric tons)
II b (Ministry of Local Fuel Belorussia)[126]	two six	50,000 per annum 5,000 per annum
III - Ukraine	Unknown	50,000 per annum
II a Estonia Latvia	Unknown Unknown	50,000 per annum 70,000 per annum

However, the 1950 goal for the RSFSR alone, was not reached. Production in 1950 was reported as 3.5 times as great as pre-war.[127] As 1940 production, with only the Orekhovskiy Plant in operation, was only 60,000 metric tons, the 1950 production is estimated at only 210,000 metric tons, instead of the planned 500,000[128] metric tons. The explanation of this failure probably lies in the continued construction of small capacity plants (5 to 10 thousand ton) instead of larger ones with 10 to 20 thousand ton capacity. In 1947[129] there were reports of increasing construction but in 1951, criticism of lagging production appeared in the press and it was attributed to small capacity plants which were claimed to be not only inefficient but also expensive.[130] Of all the postwar construction, the Tootsi Plant in Estonia is considered the best and in 1950 produced 55,000 metric tons of briquettes at a profit of 3.5 million rubles.[131]

The following Table (Table V) shows the extent and regional development of the peat briquette industry according to available information.

No information on the consumption and distribution of peat briquettes is available.

TABLE VI U.S.S.R.
Distribution of Peat Briquette Plants by Regions

Region	Location	Installation	Comment	Capacity and/or Production (metric tons)
I a - R.S.F.S.R.	Boksitogorsk Leningrad Oblast	Boksitogorsk Peat Dehydrating Works 132/	Operation started in 1949.	
*(see below for commission)				
II a - Estonia	Lavasarre	Briquette Plant 134/	Briquettes shipped Moscow, Leningrad, and Tallinn.	N.A.
	Oru	Peat Briquette Plant 135/	To be constructed under Five Year Plan.	50,000 per annum
	Poravere	Briquette Plant 136/	None	50,000 in 1940
	Pyarnu	Tootsi Peat Briquette Plant 137/	Profit in 1950 was 3.5 million rubles.	55,000 in 1950
- Latvia	Balozhi	Baloshi Peat Briquette Plant 138/	Operation at capacity started in 1949.	N.A.
- Lithuania	Baltoyi, Vilnus Uyezd	Baltoyi Voke Briquette Plant 139/	Operation started November 1949.	N.A.
	Shaulyai	Peat Briquette Plant 140/	Under construction (1946)	N.A.
II b - Belorussia	nr. Belokorovichi Station, Zhitomir Oblast	Peat Briquette Plant 141/	Under construction, to be in 1948. Production mainly for household use.	50,000 per annum
	Smolevichi Minsk Oblast	Peat Briquette 142/	To be completed by 1950 under Five Year Plan. (doubtful) (1949)	
*I a - R.S.F.S.R.	Leningrad Oblast	Farnovskiy Peat Briquette Plant 133/	Under construction Equipment will be imported from Sweden. (1947)	N.A.

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TABLE VI U.S.S.R.
(cont.)
Distribution of Peat Briquette Plants by Regions

Region	Location	Installation	Comment	Capacity and/or Production (metric tons)
II b - Belorussia	N.A.	Vertselishki Peat Briquette Plant 143/	Planned construction.	N.A.
	Zhitkovichskiy Rayon, Polesskaya Oblast	Peat Briquette Plant 144/	Under construction (1949)	N.A.
V - Armenian SSR	Kalinino	Peat Briquette Plant 145/	Under construction (1949)	n.a.
VI - Tatar ASSR	Kazan	Peat Briquette Plant 146/	None	N.A.
VII - R.S.F.S.R.	Moscow Oblast	Dulevskiy Peat Briquette Plant 147/	Construction completed (1949)	10,000 per annum.
	Moscow Oblast	Orudyevskiy Peat Briquette Plant 148/	Operation started in 1946. Briquettes for household use.	N.A.
	Dmitrov Moscow Oblast	Peat Briquette Plant 149/	Planned output 1946 10,000 metric tons.	6,000 in 1946
VIII - R.S.F.S.R.	Berezovskiy Sverdlovsk Oblast	Peat Briquette Plant 150/	Being equipped for production (1947).	N.A.

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IV. Czechoslovakia

A. Production

Fuel briquettes are produced in both the Ostrava-Karvinna and Falknov coal basins in Czechoslovakia. There are five known patent fuel plants located in the Ostrava-Karvinna bituminous coal area, northeast of Praha, and five brown coal briquette plants in the Falknov brown coal area northwest of Praha. The five patent fuel plants are said to be located in or near the cities of Michalkovice, Moravska-Ostrava, Petrovald, and Zostavka v Brna.[151]

Brown coal briquette plants in Czechoslovakia are all under the administration of the Falknovska panev.[152] In the Falknov district there are known to be plants at Harbatov,[153] and Kysperk nad Orlici.[154] Other plants are said to be located at Nove Sedlo.[155]

Little is known about the capacity production of the plants and their past performance. The US Bureau of Mines has estimated a capacity production of 500,000 metric tons per year of patent fuel and 400,000 metric tons per year of brown coal briquettes; annual production has been reported as follows:[156]

Year	Patent Fuel (metric tons)	Brown Coal Briquettes (metric tons)
1947	259,130	283,645
1948	311,489	291,326
1949	350,000	297,000
1950	387,500	303,300
1951	395,000	400,000

B. Export

Information obtained in 1951 indicates that some of the brown coal briquette production from the Harbatov[157] and Nove Sedlo[158] plants is being exported, that from the former going mainly to Switzerland.[159] Following are the export figures for 1947 through 1951.

Destination	1947	1948	1949	1950 [160]	1951 [160]
		(metric tons)			
Austria	N.A.	N.A.	-0- [161]	N.A.	8,400
Germany (Western)	N.A.	N.A.	N.A.	34,800	6,500
Switzerland	1,295 [162]	100 [162]	1,900 [163]	100	-0-

C. Consumption

Prewar figures indicate that 84 percent of total patent fuel production was consumed by railroads and 13 percent by industrial establishments. About 88 percent of brown coal briquette production was used for household heating, the remaining 12 percent going for export.[164]

Current data on consumption are unavailable.

V. Poland

By far the greatest amount of the fuel briquettes manufactured in Poland are made from bituminous coal fines. This is due to the mining conditions in the Silesian coal fields which result in the production of a considerable amount of coal dust and fines for every tons of coal mined. In some mines, such as the Saturn mine at Sosnowiec, 40 percent of the coal mined is dust[165], whereas at the President mine near Chorzow only 10 percent of the production is dust.[166] By mixing these dusts and fines with a binder, such as tar, a satisfactory fuel can be obtained.

It has been reported that the important patent fuel plants are located in or near Walbrzych, Chorzow, Zabrze, and Bytom.[167] There is believed to be more than one lignite briquette plant, although definite information reports only the Lofix Briquette Factory (Fabryka Brykietow Poppalkowych) at Bialy Kamien mine. At this plant small briquettes made of lignite dust and naphthalene are produced for furnace (q.v.) use.[168] Since the lignite produced at the Turow mines is shipped directly to the Hirschfeld power plant either as briquettes or in an unprocessed state, the briquettes are not accounted for in the total Polish production figures. According to one source, 4.2 million metric tons of brown coal briquettes were involved in this transaction in 1949.[169] Production of patent fuel and brown coal briquettes during the years 1947 through 1951 have been supplied as follows by the US Bureau of Mines:[170]

Year	Patent Fuel (metric tons)	Brown Coal Briquettes (metric tons)
1947	631,915	41,697
1948	717,508	113,633
1949	694,800	170,000
1950	631,300	169,300
1951	622,000	159,000

There is no information concerning either the consumption or foreign trade of patent fuel or brown coal briquettes in Poland.

VI. Bulgaria

Very little is known about the manufacture of brown coal briquettes in Bulgaria. Reportedly, there is a briquette plant one kilometer west of Pernik in Western Bulgaria which is attached to the Temelko Nenkof coal mine; there is some possibility that this is identical with the briquette plant at Dimitrovo.[171] No production figures are supplied in the reference material. Other material mentions a lignite manufacturing plant, possibly meaning the manufacture of briquettes, located in Dimitrovgrad in Central Bulgaria. Daily output of this plant is given as 20 metric tons.[172]

The US Bureau of Mines has estimated the production of brown coal briquettes in Bulgaria as follows:[173]

Year	Brown Coal Briquettes (metric tons)
1947	100,000
1948	150,000
1949	150,000
1950	200,000
1951	200,000

No information on the consumption of brown coal briquettes in Bulgaria is available. It may be assumed that they are consumed for comestic heat and by small industry.

VIII Hungary

There are at least three brown coal briquette plants in Hungary located at Pecs,[174] in the Budapest area,[175] and at Tatabanya.[176] There is believed to be more than one plant at Pecs although exact data are lacking.

Briquette production has been estimated by the US Bureau of Mines as follows:[177]

Year	Brown Coal Briquettes (metric tons)
1947	70,970
1948	90,000
1949	100,000
1950	125,000
1951	150,000

No information is available on the consumption of brown coal briquettes in Hungary.

VIII Rumania

Information on the fuel briquette industry of Rumania is incomplete, but the existence of several briquette plants has been reported.

The newest briquette project is one completed in March 1951 and is connected with the Filipesti de Padura-Palangei-Provita Valley lignite mines.[178] Construction of another group of plants in the Sotanga lignite area was started in that same year.[179] Completion of a third group was expected in 1951 in the Derna-Tatarus lignite area, between the towns of Marghita, Suplacu-de-Barcau, and Derna Tatarus.[180] Planned production of these plants has not been reported.

Two, or possibly three, other briquette plants are known to be in operation currently and are believed to have been in operation before World War II. The Concordia Briquette factory at Vulcan, in operation in 1944, resumed production in 1948 for the first time since the War.[181] The production rate was reported as 4.4 metric tons per hour.[182] Probably identical with this plant is the Vulcan briquette factory which receives its coal from the Corin and Priboiu mines and produces 1000 (q.v. probably 100) metric tons a day.[183] A third plant is located in Recita, owned by the Recita Iron Mill and Corporate Holdings, and was reported in 1940 to be producing 50 metric tons of briquettes per day.[184] It is highly probable that there are other briquette plants in Rumania because there are at least fifty lignite and brown coal mines in the western section of the country.

The US Bureau of Mines has estimated brown coal briquette production in Rumania as follows:[185]

Year	Brown Coal Briquettes (metric tons)
1947	175,000
1948	200,000
1949	200,000
1950	250,000
1951	250,000

Very little is known about the distribution and consumption of briquettes in Rumania. Because the country produces quantities of petroleum sufficient for its own industrial requirements and also for export, it is believed that briquettes are produced solely for domestic consumption.

IX China

Information obtained between 1939 and 1951 indicates the existence of at least five briquette plants in the eastern area of China and Manchuria. The earliest reference dated 1939 is to a plant at Fouhsin (production unknown) in what is now Liaohsi Province.[186] In 1942 production at the Yent'ai briquette plant, Liaotung Province, was reported in considerable detail as follows:[187]

Year	Production (metric tons)
1933	107,460
1934	110,600
1935	112,380
1936	160,000
1937	196,000
1938	238,000
1939	214,500
19	

This plant was owned by the South Manchurian Railway Company, Ltd. A third plant is believed to be located at Pench'ihu, Liaotung Province, and is part of the Pench'ihu Iron and Steel Company, Ltd. According to one report dated 1946, this plant has six briquette presses with a total capacity of 470 metric tons a day.[188] This figure is believed to apply to pre-Soviet Soviet confiscation, because a report received in 1951 claims productionto have risen from nil to 10 metric tons a day by August 1947.[189] Information dated 1945 reports the existence of a briquette plant at Dairen owned by the Manchuria Chemical Industry Company. Daily production was five metric tons at date of information.[190] A Chinese report, dated December 1948, indicates the presence of a briquette plant in Shanghai having 612 employees or more; further details on production were not given.[191]

Because all the plants mentioned above are in east China, it is believed that they produce bituminous coal briquettes. The known lignite and brown coal deposits are located at too great a distance from the general area to make transportation feasible.

SECURITY INFORMATION

Production statistics for China as a whole are unavailable, as are those of export and consumption.

X. Gaps in Intelligence

The primary gaps in intelligence are:

1. Location, capacity, production, and source of raw materials of briquette plants;
2. Origin, inventory, and condition of present equipment;
3. Relationship between input of raw materials and production of briquettes in various plants, regions, and countries;
4. Input requirements for briquette plants and industry;
5. Foreign trade figures, including areas of destination and end-use of exported quantity;
6. Consumption by categories of consumers, including specific quality and type desired by consumer for specific use;
7. Accurate dexcriptions of new processes;
8. Status of equipment manufacturing industry throughout the Bloc, but particularly in the USSR and East Germany;
9. Current and future programs for construction of briquette plants and status of such construction;
10. Five Year or any other plans for production of briquettes.

XI. Methodology

All figures in the foregoing report are based on available source material. This includes all future production figures.

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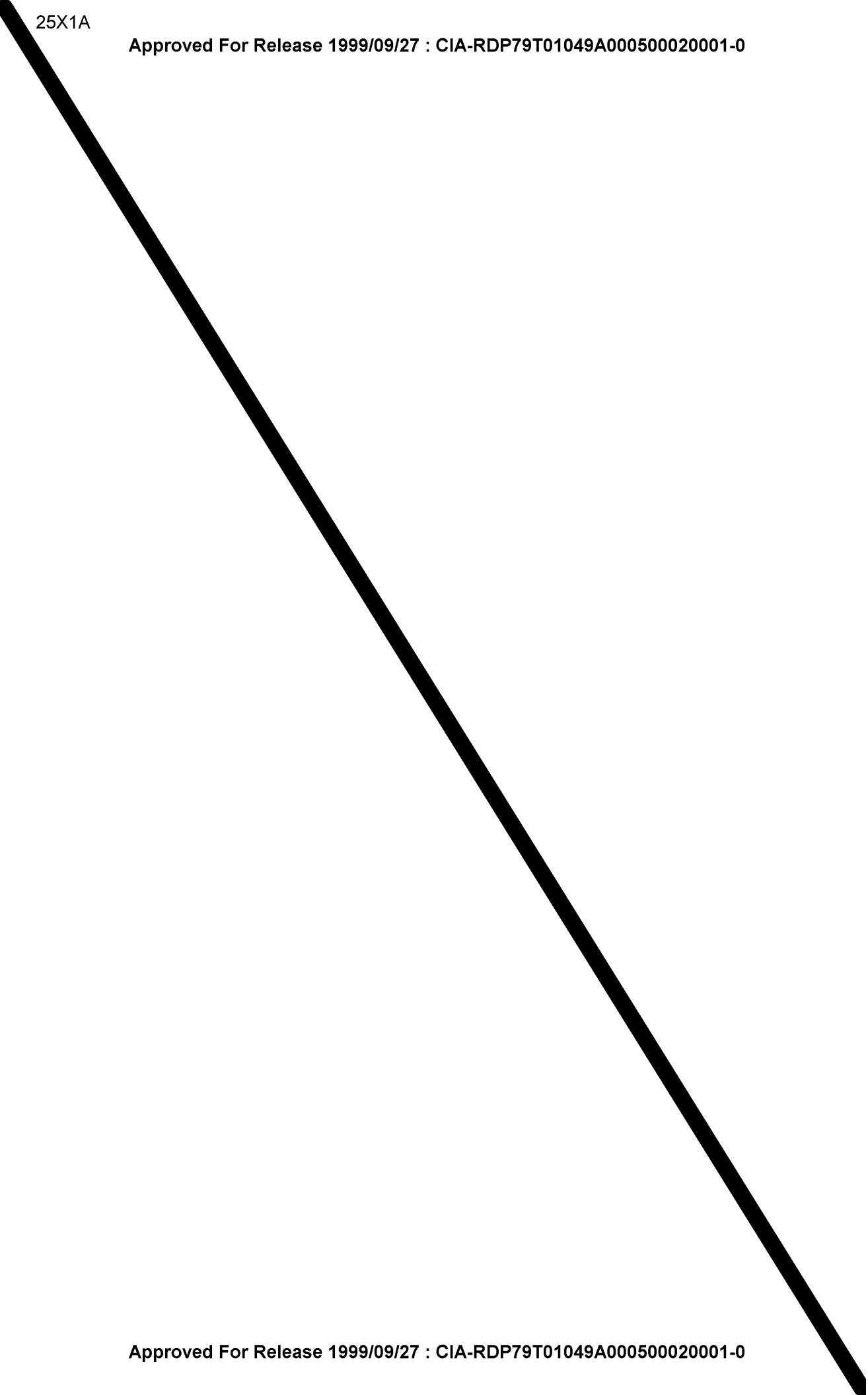

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